

LS&C MODEL 1022

LIQUOR DIVERT SYSTEM



Let our vast experience, knowledge and superior equipment protect and optimize the performance of your recovery boiler.



LIQUID SOLIDS CONTROL, INC.

MODEL 1022 IS THE #1 AUTOMATIC BLACK LIQUOR DIVERT SYSTEM WORLDWIDE!

Liquid Solids Control, Inc. developed the first commercially available Automatic Black Liquor Divert System in the late '70s. Since then, LSC has dedicated itself to meeting the needs of the Pulp and Paper Industry. In doing so, LSC has become the predominant supplier of Automatic Divert Systems. Once again LSC demonstrates its continual leadership and is proud to offer the Model 1022 Automatic Liquor Divert System. Contributing to LSC's extensive experience in the design and development of this equipment were many invaluable suggestions and mandates from several of the most prominent users/customers within the Pulp & Paper Industry. The LSC Model 1022 performs all necessary operational functions, including a number of "first-ever" features, and it fully complies with all of the current recommendations of B.L.R.B.A.C. (such as single unit operation during a prism wash cycle). With all the hardware, and the software, specifically designed for the Safe Firing of Black Liquor, the Model 1022 is an Automatic Liquor Divert System proven to provide the highest in reliability, while ensuring the ultimate in safety. The Model 1022 is equally appropriate as a devoted "stand alone" system (operates the Divert Valve directly) or to be integrated with a modern Burner Management System (DCS) through various discrete dry contacts.

Advanced Divert Logic Provides the Ultimate in Reliability & Safety

- Accurate "dual" solids measurement, combined with the ultimate in dependability
- Automatically will remove a refractometer from operation when deemed necessary
- "Smart Wash Technology" - plus, full divert capabilities maintained during an automatic prism wash
- Internal display screen for settings, diagnostics/troubleshooting and history file
- Extensive reporting capabilities - all changes/events logged with both date and time
- Intelligent fluorescent display (external) located on enclosure or remotely on the operator console
- Exclusive - "first-out"/sequence report to aid in understanding any possible R.B. "liquor diversions"
- Hard copy option (printer available) of all settings, alarms, and logged events/history
- No simple arbitrary "disable" mode
- All automatic "divert" features are retained during single refractometer operation
- Complies with all recommendations of Black Liquor Recovery Boiler Advisory Committee (BLRBAC)

OPERATIONAL SPECIFICATIONS

RANGE:	55-75, 55-80, 55-85% Solids
ACCURACY:	+/- 0.5 % of Range
LIQUOR TEMP Maximum:	150° C
LIQUOR TEMP Swing:	+/- 15° C
TEMPERATURE COMP:	Automatic, Electronic
LIQUOR LINE SIZE:	Any Pipe Line Size
LINE PRESSURE:	Up to 150 psi, as standard
ANALOG OUTPUT (A):	4-20 mA isolated
ANALOG OUTPUT (B):	4-20 mA isolated
PRINTER INTERFACE:	Output Available
ENCLOSURE:	NEMA 4 X SS Wall Mount
INPUT POWER:	115/230 VAC 50/60 HZ
	Approximately 90 WATTS
UNINTERRUPTIBLE POWERSOURCE IS ADVISED	

DISCRETE ALARM OUTPUTS

Liquor Divert Accomplished
Liquor Divert Valve Failure
2% Solids Differential
"A" Low Solids Alarm
"B" Low Solids Alarm
Refract. (A) Malfunction
Refract. (B) Malfunction
A Unit Prism Wash Failure
B Unit Prism Wash Failure
"A ONLY" Single Operation
"B ONLY" Single Operation
System Malfunction
System Maintenance

Inputs
(External Source)

Auxiliary Divert Command
Divert Valve Position
Gate Adaptors Position

Because of continuous research and development, with a keen interest in improving our product, Liquid Solids Control, Inc. reserves the right to make any model revisions and/or changes to these specifications, without notice.

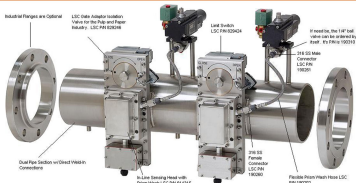
MICRO PROCESSOR FUNCTIONS & RESPONSIBILITIES

The "brain" of the Model 1022 system is the Central Processing Unit (CPU). Through the combination of LSC's vast experience with modern technology, dynamic and progressive "first-ever" features emerged. Precise user friendly software designed with on-screen prompting allows simple access to all information in the programming/diagnostic module in the processor enclosure. Redundant power supplies provide a secure power source to the CPU, assuring maximum up time for the system. In any case, failure of the CPU will result only in a "fail-safe" condition.

CPU RESPONSIBILITIES

- Providing output signal to the divert valve... or burner management system
- Monitoring the A & B Refractometers
- Self-diagnostic/troubleshooting
- Automatically deciding dual or single refractometer operation
- "Smart" prism wash cycle
- Functional/operational alarms
- Setting/event/history memory

The physical layout of the Model 1022 is both logical and systematic. The electronics are in three distinct sections and all wiring connections are to one large clearly marked connection board, logically arranged.



BLACK LIQUOR % SOLIDS MEASUREMENT

Utilizing and incorporating "field proven/time proven" LSC In-Line Sensing Heads and In-Line piping hardware, the LSC Model 1022 reliably measures Black Liquor Dissolved Solids. Coupled with the specially designed refractometer electronics, precise and accurate liquor solids data is continually provided to the Central Processing Unit (CPU). High level integrity of data is assured by numerous watch-dog checks continually performed by the CPU throughout the Refractometers and System. True dual Liquor % Solids measurement is achieved by Refractometer "A" and Refractometer "B" operating totally independent of each other (they are not "slaved" together in any way).

"SMART WASH TECHNOLOGY" PRISM WASH LOGIC

With the advent of microprocessor technology, LSC was solely responsible for developing and introducing prism wash logic known as "Smart Wash Technology". The CPU monitors each (A-B) Sensing Head Prism Face as it washes every 20 minutes, at alternate 10 minute intervals, and controls the duration to wash for "only as long as necessary" ... usually only a few seconds. In the event a prism wash is not successful, another attempt (retry) will be made shortly thereafter to clear the problem before an alarm is indicated. In the unlikely event the wash was not successful, the CPU will set the appropriate (A-B) prism wash failure alarm. "Smart-Wash" eliminates most prism wash maintenance problems. To further enhance this feature, LSC has incorporated a new wash nozzle design to eliminate the possibility of problems with high solids, and high viscosity liquors, including eucalyptus. During the time that either unit is in prism wash, the Model 1022 maintains full automatic divert operation on the basis of the other operating unit (Automatic Single Unit Operation) to eliminate dead time during prism wash. Solids display, and associated outputs are on "hold" during the prism wash time of that particular unit.

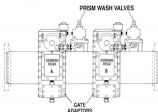


FIGURE 1

HISTORY

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GatCL: 70.3% BOP: SET
09/20/99 11:16:21
70.4%: 70.3% BOP: CLR
09/20/99 11:16:25
70.4%: GatCL AOP: SET
09/20/99 11:16:33
70.4%: 70.3% AOP: CLR
0 event(s) more recent
EXIT

```

HISTORY & DIAGNOSTICS

Settings, events and abnormal situations are displayed by the programming / diagnostics module and/or operator interface panel for quick and easy reference. Numerous display screens provide pertinent information, data and events that are time and date tagged.

(History report - Figure 1)

(Refractometer diagnostics - Figure 2)

FIGURE 2

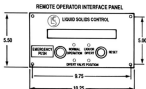
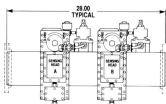
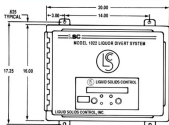
Refractometer A:

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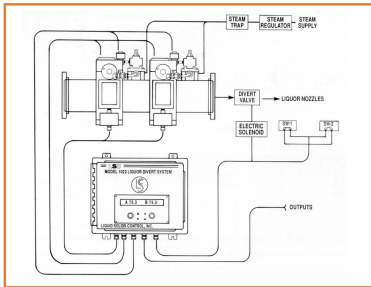
Solids: 70.4% 7.72V
Lamp: 5.2V Gate: OPEN
Temp: 127°C 1.08V
      1.0 V
Power: +15.1-14.7
EXIT

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DIMENSIONAL INFORMATION



SYSTEM CONFIGURATION



GATE ADAPTOR

A highly cost effective "Black Liquor Service device" Designed to safely isolate the sensor to maintain, repair or replace it, with out interrupting the process

The LSC gate adaptor (isolation valve) provides a means for simple and quick removal of an LSC In-Line Sensing Head from an active liquor line while insuring safety. This dedicated unit eliminates the need for costly "By-Pass-Loops", or an unscheduled liquor line shutdown to allow maintenance or calibration. A device of this type is specifically recommended by B.L.R.B.A.C. as they are against by-pass-loops.

The gate adaptor provides the option of externally locking it with a pad lock which gaurantees positive visual and physical indication of locked "fully open" or "fully closed" The lock can not be employed if the gate is less than 100% open/closed. Proper switch contacts are provided so the model 1022 to indicate closing of the gate adaptor which automatically puts that unit out of service by going into "single operation" mode.

PIONEER & LEADER OF RELIABLE & EFFECTIVE AUTOMATIC LIQUOR DIVERT SYSTEMS



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